

refractory oxide source used to prepare the extrudable mass in step (a) further comprises a powder of the low acidity oxide refractory source.

A2  
12. (Amended) A hydrocarbon conversion process comprising the step of contacting a hydrocarbon feedstock with the catalyst produced according to the method of claim 1.

REMARKS

Claims 1-16 are pending in the application. Claims 1-16 are rejected.

Claims 4 and 12, and the abstract of the disclosure are amended herein in response to the Examiner's objections under headings "Specification", "Claim Objections" and "Claim Rejections - 35 USC § 112". The amendment to claim 12 is based on the specification, page 9, lines 13-15. It will be clear that the hydrocarbon conversion processes of claim 12 may or may not be performed in the presence of added hydrogen (cf. page 9, line 18 – page 11, line 2).

Under the heading "Claim Rejections - 35 USC § 112", claims 1-16 have been objected to as being indefinite as the term "low acidity refractory support" (cf. claim 1) is a relative term, which would render the claims indefinite. This term is well known to one of ordinary skill in the art as referring to a certain, well-known class of refractory supports. In the present specification (cf. page 3, lines 3-7) this well-known class of refractory supports has been illustrated by exemplifying ample representatives: silica, zirconia, titanium dioxide, germanium dioxide, boria and mixtures of two or more of these, like for example silica-zirconia and silica-titania. In US patent 5,053,374 (cited by the Examiner under the heading "Claim Rejections - 35 USC § 103") the same terminology is employed, and many examples of low acidity refractory oxides have been given (cf. US patent 5,053,374, for example col. 4, lines 27-42). All these refractory oxides are well known to one of ordinary skill in the art as belonging to the class of low acidity refractory supports. It is respectfully submitted that, therefore, one of ordinary skill in the art will reasonably be apprised of the scope of the invention.

The following observations are made in response to the rejection of claims 1-16 under the heading "Claim Rejections - 35 USC § 103".

Claims 1-9 and 11-16 are rejected under 35 USC § 103(a) as being unpatentable over Absil et al. (US patent 5,053,374; referred to hereinafter as "Absil") in view of Denton (US patent 4,256,682).

Absil teaches a method for preparing a catalyst comprising a zeolite and a low acidity refractory oxide binder which is essentially free of alumina comprising preparing an

extrudable mass comprising the zeolite, water and a source of the low acid refractory oxide binder comprising an acid sol, for example colloidal silica. Absil points to the critical role of the colloidal silica as a binder, viz. as providing crush strength (column 8, lines 11-15; column 9, lines 67-68). Absil has been acknowledged in the present application text (cf. page 1, lines 9-22).

The gist of the present invention is that -relative to Absil's teaching- catalyst compositions can be made which have an improved strength by using in the binder, as an additional component, an amine compound (cf. specification, page 2, line 7 - page 3, line 2; working examples). Thus, the invention provides a solution to the problem of providing catalyst compositions with increased strength, and the solution is the use of an amine compound as an additional component in the extrudable mass. The Examiner has acknowledged that Absil does not disclose the presence of an amine in the extrudable mass.

Denton discloses silica pellets which are prepared by a method which comprises mixing silica gel particles with aqueous ammonia. The pellets have "unexpectedly high average crush strength". The silica gel has a particle diameter of e.g. 75-250 microns in diameter (cf. column 3, lines 27-30, Example 1), and therefore the silica gel is not a sol, or colloidal silica. Denton does not disclose the use of any binder, for example an acid sol, such as colloidal silica, for binding the silica particles together. Thus, Denton's pellets are without an acid sol, i.e. without binder. Further, Denton does not disclose what caused the pellets to have "unexpectedly high average crush strength", and "unexpectedly high average crush strength", as such, is vague, relative terminology. There are no (comparative) examples showing that an amine component, e.g. ammonia, would or would not increase the crush strength of the silica pellets, for example, relative to embodiments which do not include ammonia, but include for example water instead of ammonia.

Thus, it is respectfully submitted that one of ordinary skill in the art would have no incentive consulting the teaching of Denton, when faced with the problem of increasing the crush strength of catalyst compositions as taught by Absil. On the other hand, if he would nevertheless consult the teaching of Denton, he would not find any information which would bring him closer to the present invention. One reason is that Absil's pellets contain an acid sol as critical binder component, whereas Denton's pellets are without a binder, let alone an acid sol. Another reason is that there is no teaching in Absil that by using ammonia the strength of pellets can be increased. Therefore, it would not have been obvious to one of ordinary skill in the art to have modified the method of making the catalyst of Absil by including ammonia in the extrudable mass as suggested by Denton because the crush

strength of the catalyst would be increased. The invention as claimed in claims 1-9 and 11-16 is patentable over Absil in combination with Denton.

Claims 10 is rejected under 35 USC § 103(a) as being unpatentable over Absil in view of Denton as applied to claim 9, and further in view of Breck et al. (US patent 4,505,023; referred to hereinafter as "Breck").

The teaching of Absil is as above.

The teaching of Denton is as above.

As argued hereinbefore, it is not obvious to one of ordinary skill in the art to combine the teachings of Absil and Denton in the light of the present invention.

According to the Examiner, Breck is concerned with a zeolite dealumination process which utilizes a fluorosilicate salt as claimed. Breck is not concerned with the problem of providing catalyst compositions with increased strength, and Breck is also not concerned with the use of a binder comprising an acid sol and/or an amine (cf. Breck, column 51, lines 43-50 and column 52, lines 3-8). Thus, one of ordinary skill in the art would have no motivation to consult Breck in relation to the problem underlying the present invention, and, if he would nevertheless do so, he would not find any useful teaching in addition to the teachings of Absil and Denton, which could have directed him to the solution of this invention. It is therefore respectfully submitted that the invention as claimed in claim 10 is patentable over Absil in view of Denton and Breck.

Attached hereto is a marked-up version of the changes made to the claims by the present amendment. The attached pages are captioned "Version with markings to show changes made."

In view of the remarks, Applicant respectfully submits the claims are now in condition for allowance. Reconsideration and withdrawal of the rejections of claims 1-16 is requested. Allowance of claims 1-16 is solicited.

Respectfully submitted,

VAN CRIJNEN-BEERS ET AL

**OFFICIAL**

By

*Beverlee G. Steinberg*  
Their Attorney, Beverlee G. Steinberg  
Registration No. 37,736  
(713) 241-7256

P. O. Box 2463  
Houston, Texas 77252-2463

FAX RECEIVED

Appl. No. 09/664,293 (TS-0926)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claim claims 4 and 12 have been amended as follows:

4. (Amended) The method of claim 1 wherein the zeolite content, on dry basis, is below 50 wt% as calculated on the finished catalyst and wherein the low acidity refractory oxide source used to prepare the extrudable mass in step (a) further comprises a powder of the low acidity oxide refractory source.

12. (Amended) A hydrocarbon conversion process [for hydroprocessing a hydrocarbon feedstock] comprising the step[s] of contacting [said] a hydrocarbon feedstock with the catalyst produced according to the method of claim 1 [at an elevated temperature and pressure optionally in the presence of hydrogen].